TETRA TECH

August 30, 2010

Ms. Pat Murrow
Task Order Contract Officer Representative
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

Subject: **Conclusions and Recommendations**
Environmental Indicator (EI) Codes 750
Collis Inc., Clinton, Iowa, IAD047303771
Contract No. EP-W-07-019, Task Order 038
Region 7 Task Order R719-14

Dear Ms. Murrow:

The U.S. Environmental Protection Agency (EPA) has requested that Tetra Tech EM Inc. (Tetra Tech) perform two tasks in support of EPA's ongoing corrective action activities at the facility listed above. These tasks consist of:

- Gathering and compiling facility-specific information from EPA.
- Complete an environmental indicator (EI) evaluation using EPA's September 20, 2002, revised checklists for each facility. For those facilities that do not show the applicable EIs under control, prepare recommendations regarding investigative activities necessary to close data gaps and achieve the desired status for the EI.

Tetra Tech completed these tasks for the Collis Inc. (Collis) facility in Clinton, Iowa. Tetra Tech recommends that this facility be considered as ***not*** having "Migration of Contaminated Groundwater Under Control" (CA750).

Horizontal migration of contaminated groundwater at the facility does not appear to have stabilized. Groundwater at the Collis facility is contaminated with chlorinated volatile organic compounds (CVOC), naphthalene, and cyanide. Currently, contamination north of the facility boundary has not been delineated, and MW-53, a perimeter monitoring well located north of the facility and Manufacturers' Ditch, was contaminated with vinyl chloride at a concentration exceeding the maximum contaminated level (MCL). Moreover, horizontal migration of contaminated groundwater does not appear to have stabilized based on increasing concentrations of hazardous constituents in some designated monitoring well locations beyond the northern, downgradient facility boundary.

No monitoring wells or piezometers are located north or west of monitoring well MW 53 to determine the extent of contamination or verify the groundwater flow direction with distance from Manufacturers' Ditch. Additionally, monitoring well MW-53 has been sampled only one time, so the impact of seasonal fluctuations on contaminant concentrations in and around the well cannot be determined. Additional sampling may demonstrate that concentrations of contaminants in groundwater north of the facility do not derive from Collis.

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Although a finding that migration of groundwater has not stabilized would normally stop the EI evaluation, Tetra Tech also prepared a preliminary review of the discharge of groundwater to surface water. Based on this preliminary evaluation, it also appears that contaminated groundwater may be discharging to surface water at a significant level. Vinyl chloride has been detected in monitoring wells adjacent to Manufacturer's Ditch at concentrations more than 10 times its MCL. The CA750 uses this 10-times criteria as a screening level for potential contamination of surface water. Actual surface water sampling may demonstrate that contaminated groundwater is not discharging to surface water at unacceptable levels.

If you have any questions, please call me at 816-412-1787.

Sincerely,

Heather K. Wood

Heather Wood, RG
Task Order Manager

Enclosures

cc: Aaron Zimmerman, EPA Regional Project Officer (cover letter only)
Ed Sussenguth, Tetra Tech Program Manager (cover letter only)
Kathy Homer, Tetra Tech Regional Program Manager (cover letter only)
File

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99
Revised 9/20/02

RCRA Corrective Action
Environmental Indicator (EI) RCRA Info code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: Collis Inc.
Facility Address: 2005 S. 19th Street, Clinton, IA 52732
Facility EPA ID #: IAD047303771

DETERMINATION RESULT: NO

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   X If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available, skip to #8 and enter "IN" (more information needed) status code.

The Collis, Inc. (Collis) facility is located on about 12.5 acres within the SE ¼ of the NW ¼ of Section 14, Township 81 north, Range 6 east, Clinton, Clinton County, Iowa. The facility is located within a city-designated industrial zone (see Figure 1). The facility, which is fenced, is developed with one main building and two smaller buildings; open areas are covered with asphalt, gravel, and vegetation. Surrounding land use is a mix of residential, agricultural, commercial, and light industrial activities. The facility is bounded on the north by the Chicago and Northwestern Railroad and associated rights of way, on the east by a row of trees with the Clinton Country Club golf course beyond, on the south by grass and wooded land with residential neighborhoods beyond, and on the west by S. 19th Street. Manufacturers' Ditch, a perennial stream flowing northeast to southwest, occurs along the facility's western and northern boundaries (Heritage Environmental Services [Heritage] 2000a; RMT 2008).

Prior to Collis's occupancy, the facility was used to manufacture wagon wheels (Heritage 1994). Collis began operations at the facility in 1915, manufacturing wire products, silos, windmills, and other metal products for the agriculture industry (Heritage 2000a; RMT 2006). The facility also manufactured detonators used in World War I and internal combustion engines (RMT 2006). In 1964, Chamberlain Manufacturing Corporation (currently The Chamberlain Group, Inc., a subsidiary of The Duchossois Group) purchased the Collis manufacturing facility and began manufacturing refrigerator parts, including wire racks, shelves, and other accessories (Heritage 2000a; U.S. Environmental Protection Agency [EPA] 2001; RMT 2006). The facility used zinc-cyanide and nickel-chromium plating lines until 1972, when the nickel-chromium line was converted to a zinc-cyanide plating line (Heritage 2000a). In 1984, Collis purchased certain Collis Division assets from Chamberlain Manufacturing Corporation, including the facility in Clinton, Iowa (Heritage 1994). The zinc-cyanide plating lines were converted to zinc-chloride plating lines in 1985 (Heritage 2000a). In 1998, Collis was acquired by SSW Enterprises, Inc. (currently SSW Holding Company, Inc.) (Heritage 2000a). Current operations still include manufacturing refrigerator shelving, baskets, and refrigeration accessories. The facility fabricates products from steel wire, using a variety of metal finishing techniques: zinc plating with chromium conversion coating, lacquer dip and baking, and epoxy coating (RMT 2006).

Collis also has operated a wastewater treatment plant (WWTP) since 1970. From 1970 until 1979, an estimated 1,090 cubic yards of chrome plating wastewater treatment sludge was directed to multiple 3- to 5-foot-deep, unlined

surface impoundments on the facility property (RMT 2006; St. John-Mittelhauser & Associates [SM&A] 2010). From 1979 to 1987, the facility disposed of the treatment sludge as hazardous waste at an approved landfill. Since 1987, the facility has disposed of the sludge as non-hazardous waste at a local landfill (Heritage 2000a, RMT 2006). The facility discharges wastewater to Manufacturers' Ditch under a National Pollutant Discharge Elimination System (NPDES) permit. The current permit is dated February 2006. EPA revised the facility's NPDES permit when copper, zinc, and cyanide were detected at concentrations above water quality standards in Mill Creek, to the west of the facility (Heritage 2000a, SM&A 2010).

Wastewater no longer discharged to ditch

The Collis facility has been monitored and investigated since at least 1986, when the facility closed the surface impoundments. The closure process continued from 1986 to 1993, when the facility entered into an Administrative Order on Consent (AOC) with EPA. The AOC required the facility to conduct a Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) to determine the nature and extent of releases from seven solid-waste management units (SWMU) at the facility (Heritage 2000a) (see Figure 2). Investigations of groundwater, soil, sediment, and surface water contamination continued through the 1990s, with an initial RFI conducted in 1998 and supplemental RFI sampling conducted through 2010 (Heritage 1998a, 2000b; RMT 2006; SM&A 2010).

The primary contaminants released to soil, groundwater, sediment, and surface water from Collis's SWMUs are metals derived from the plating process (especially chromium, nickel, and zinc); chlorinated and petroleum-derived volatile organic compounds (VOC); and polycyclic aromatic hydrocarbon (PAH) semivolatile organic compounds (SVOC) (Heritage 2000a). Cyanide and polychlorinated biphenyls (PCB) also have been detected in a limited number of locations at the facility (Heritage 1998a; SM&A 2010). Each SWMU is discussed below.

SWMU 1 - Floor Drain, Sump, and Overhead Pipe System (FDS). SWMU 1 includes the plating lines and other equipment used to channel waste to the WWTP, including spent caustics, rinse water, spent pickle solutions, and spent metal solutions (Heritage 1994). It was built in 1970, and the lines are still in use (Heritage 1994). Metals have been detected in subsurface soil and groundwater from the area of this SWMU (Heritage 2000a).

SWMU 2 - Pollution Control Building (PCA). SWMU 2 is the location of the process wastewater system and WWTP, consisting of several concrete underground storage tanks (UST) and two aboveground storage tanks for the batch treatment of chromate solutions, spent acid, and caustic soda solution (Heritage 1994). It was constructed in 1970 and is still in use. Metals have been detected in surface and subsurface soils, and VOCs have been detected in surface soils and groundwater at this SWMU (Heritage 1998a, 2000a).

SWMU 3 - Sludge Management Area (SMA). SWMU 3 includes the solids settling tank and sludge filter press operations that are used to process and dewater sludge from the WWTP (Heritage 1994). The WWTP was constructed in 1970 and is still used today, although sludges are now disposed of offsite (Heritage 1994). The settling basin occasionally has overflowed, and inspections of the WWTP by Iowa Department of Environmental Quality have documented several instances of poorly stored chemicals in SWMU 3 (Heritage 1994). Metals have been detected in surface soils, and VOCs have been detected in subsurface soils and groundwater at this SWMU (Heritage 2000a).

SWMU 4 - Sludge Impoundment Area (SIA). SWMU 4 includes the area of the former sludge impoundments, which were built in 1970 as part of the WWTP and received sludge until 1979 (Heritage 1994). Sludges are now sent to an offsite landfill (Heritage 1994). The SIA impoundments were excavated to a depth of about 3 to 5 feet below grade but were not lined (Heritage 1994; SM&A 2010). In some cases, the bottom of the impoundment was at the water table (Heritage 1994). Although the reported number of impoundments varied, with as many as seven impoundments for hazardous waste (sludges) before 1980, there were five impoundments in 1980 when the facility began the closure process (Heritage 1994). The facility conducted closure activities (excavation and investigation) from 1986 to 1990, but the facility never received a clean-closure certification (Heritage 2000a). The area is now grass covered, and the impoundments were filled with a variety of materials, including organic matter, clay, cinders, bricks, glass fragments, metal shavings, and gravel (Heritage 1998a). Metals have been detected in surface and

subsurface soils. PCBs, VOCs, and SVOCs have been detected in surface soil (Heritage 2000a). VOCs have also been detected in groundwater (Heritage 1998a).

SWMU 5 - Spent Chromic Acid Tank. SWMU 5 was a 5,500-gallon tank located in the northwest portion of the production building. From 1975 until 1985, the tank was used for storing chromic acid prior to treatment. In 1988, the tank was emptied, rinsed, and relocated to the filter building. No evidence of a release was documented (RMT 2008). The Spent Chromic Acid Tank was outlined in the AOC but was not recognized as a SWMU in the RFI process until 2008.

SWMU 6 - Closure Pretreatment Area (CPA). SWMU 6 was used from 1986 to 1987 as an area to treat water generated during the closure of the sludge impoundments (Heritage 1994). It consisted of three 27-foot-diameter swimming pool tanks and was dismantled in 1988 (Heritage 1994). Metals have been detected in surface soil, and VOCs have been detected in groundwater from the area of this SWMU (Heritage 2000a).

SWMU 7 - Northeast Yard and Receiving Dock, Outdoor Storage Yard (NEY). SWMU 7 is an area used for receiving, storing, and shipping products and waste (Heritage 2000a). It was also the location of a railroad spur (no longer in service) and a gasoline UST that was removed in 1988 (Heritage 1994, 1998b). The area currently is used to store empty drums, scrap metal, and used oil (Heritage 1994). Metals, VOCs, SVOCs, and PCBs have been detected in surface and subsurface soil. VOCs have been detected in groundwater from the area of this SWMU (Heritage 1998a).

SWMU 8 - Manufacturers' Ditch Area (MDA). SWMU 8 is the main stormwater drainage ditch for Collis and other industrial, residential, and agricultural stormwater runoff from upstream and downstream of the facility (Heritage 1998a). In 1992, the ditch was dredged and excavated by the City, and the materials were used as fill material at a nearby park (Heritage 1994). Metals and VOCs were detected in soil and sediment, and VOCs were detected in groundwater from this SWMU (Heritage 2000a). Surface water was not significantly contaminated.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRA Info national database ONLY as long as they remain true (i.e., RCRA Info status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria [e.g., Maximum Contaminant Levels (MCLs), the maximum permissible level of a contaminant in water delivered to any user of a public water system under the Safe Drinking Water Act]) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

__X__ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

_____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

The Collis facility sits in the alluvial flood plain of the Mississippi River, which runs approximately 2.5 miles south and east of the facility (see Figure 1). Unconsolidated sediment beneath the facility consists of alluvial clayey silt and silty clay interbedded with variable seams of silt, silty sand, sand, and gravel (Heritage 1994). Fill material also is present beneath much of the facility, with greater thicknesses beneath buildings and other improved areas (SM&A 2010). Two former river channels have scoured the bedrock surface beneath the alluvium and fill; depth to bedrock ranges from 6 feet below ground surface (bgs) southeast of the former surface impoundments to 118 feet bgs near the center of the south property line (Heritage 1994). The uppermost bedrock is Silurian limestone that has been weathered and fractured at its surface (Heritage 1994). The Silurian has been completed removed approximately 1 to 2 miles south of the facility along the Mississippi River (Heritage 1998a). The Silurian bedrock is underlain by a thick sequence of Ordovician confining beds, then by another relatively thick sequence of Cambrian and Ordovician sandstone and dolomite aquifers (Heritage 1998a).

Monitoring wells and piezometers at the Collis facility are screened at four facility-established intervals (see Attachment 1) (SM&A 2010). These intervals are based primarily on well depth (SM&A 2010). Their uniqueness as aquifer units was not established in the 2010 RFI report.

1. First saturated unit: MW-22A, MW-30, MW-32, MW-33, PZ-33, PZ-35, PZ-36, MW-38, MW-39, PZ-40, PZ-41, PZ-44, PZ-47, PZ-48, PZ-49, MW-50S, MW-51S.
2. Upper unconsolidated sediments and weathered bedrock: MW-2, MW-4, MW-13, MW-31, MW-34, MW-35, MW-36, MW-37, MW-44, MW-45, MW-46, MW-47S, MW-48S, MW-50.
3. Lower unconsolidated sediments and upper bedrock: MW-1, MW-42, MW-44D, MW-47, MW-48, MW-51, MW-53S, MW-53.
4. Deep bedrock: MW-42D, MW-43.

Manufacturers' Ditch, the nearest surface water body to the Collis facility, is a perennial, low-flow stream that flows from northeast to southwest along the facility's northern and western boundaries (Heritage 1994, SM&A 2010). Using groundwater elevation data from the 2010 RFI supplemental investigation, the facility determined that groundwater flow in the first saturated unit, upper unconsolidated sediment/weathered bedrock, and lower unconsolidated sediment/upper bedrock generally is toward Manufacturers' Ditch (see Attachment 1) (SM&A

[1]"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

2010). On the facility side of the ditch, groundwater flow is to the northwest; on the north side of the ditch, groundwater flow is to the southeast (SM&A 2010). Flow direction is undetermined in deep bedrock, as only two monitoring wells are screened at this depth (SM&A 2010). The facility also used the 2010 groundwater elevation data to calculate vertical hydraulic gradients for nested well clusters and groups of wells along Manufacturers' Ditch. Upward vertical gradients were calculated for multiple wells along Manufacturers' Ditch (SM&A 2010).

Groundwater samples at the Collis facility have been collected from 1995 to 2010 as part of the RFI (Heritage 2000a, d; RMT 2006; SM&A 2010). Groundwater samples collected for the RFI have been analyzed for VOCs, SVOCs, PAHs, PCBs, total and dissolved metals including hexavalent chromium, total and amenable (free) cyanide, total suspended solids, and total dissolved solids (Heritage 1998a, SM&A 2010).

Table 1 shows the maximum concentrations of VOCs, PAHs, total and amenable cyanide, and total and dissolved metals in samples collected from wells and piezometers at the facility. None of the dissolved metal concentrations exceeded the relevant EPA maximum contaminant level (MCL) or EPA tap water regional screening level (RSL). Unfiltered samples from well MW-22 had very high concentrations of metals, but this well had excessive suspended solids and was subsequently abandoned (Heritage 2000a). Similarly, the only sample that exceeded the MCL for cyanide was collected from MW-22 (Heritage 1998a).

Chlorinated VOCs are the primary constituents of concern in groundwater from the facility. The compounds 1,1-dichloroethene (DCE), 1,2-DCE, trichloroethene (TCE), and vinyl chloride (VC) are all present in concentrations that exceed their relevant MCLs, with historic maximum concentrations of 8 micrograms per liter [µg/L], 1,200 µg/L, 600 µg/L, and 500 µg/L, respectively (Heritage 1998a, 2000b, c, d; RMT 2006; SM&A 2010). In the 2010 groundwater sampling event, these constituents were detected at concentrations above MCLs, with maximum concentrations of 557 µg/L *cis*-1,2-DCE, 389 µg/L TCE, and 157 µg/L VC.

TABLE 1 – MAXIMUM CONCENTRATIONS OF CONSTITUENTS IN GROUNDWATER

Constituent	Concentration (µg/L)	Well	Date	EPA MCL (µg/L)	Other Wells Exceeding MCL
Volatile Organic Compounds					
Acetone	32	MW-2	July 1997	22,000*	None
Benzene	0.28	MW-39	July 2005	5	None
Chloromethane	0.43	MW-32	July 2005	190	None
1,1-Dichloroethene	**8**	MW-39	May 1996	7	None
cis-1,2-Dichloroethene	**1,100**	MW-39	May 1996	70	MW-2, MW-34, MW-35, PZ-35, MW-36, PZ-36, MW-37, MW-39, PZ-41, MW-42, MW-45
trans-1,2-Dichloroethene	56	MW-39	May 1996	100	None
1,2-Dichloropropane	0.88	MW-35	July 2005	5	None
Ethylbenzene	1.61	MW-22A	July 2005	700	None
Toluene	5	MW-38	May 1996	1,000	None
Trichloroethene	**600**	MW-42	September 2000	5	MW-2, MW-13, MW-34, MW-35, MW-36, PZ-41, MW-42, MW-45, MW-51

TABLE 1 – MAXIMUM CONCENTRATIONS OF CONSTITUENTS IN GROUNDWATER

Constituent	Concentration (µg/L)	Well	Date	EPA MCL (µg/L)	Other Wells Exceeding MCL
Vinyl chloride	**500**	MW-38	July 1997	2	MW-2, MW-13, MW-34, MW-35, PZ-35, MW-36, PZ-36, MW-37, MW-38, MW-39, PZ-40, PZ-41, MW-42, MW-45, MW-50, MW-50S, MW-51S, MW-53
Polycyclic Aromatic Hydrocarbons					
Fluoranthene	0.116	MW-50	May 2010	1,500*	None
Naphthalene	**0.219**	MW-42D	May 2010	0.14*	None
Amenable (Free) Cyanide					
Cyanide	**260**	MW-22	August 1995	200	None
Total Cyanide					
Cyanide	260	MW-22	August 1995	N/A	N/A
Dissolved Metals					
Arsenic	5.85	PZ-47	February 2010	10	None
Barium	254	MW-53S	May 2010	2,000	None
Cadmium	0.576	MW-30	May 2010	5	None
Chromium	40	MW-2	August 1995	100	None
Copper	25	MW-39	July 2005	1,300	None
Lead	13.1	PZ-36	February 2010	15	None
Nickel	526	MW-39	July 2005	730*	None
Zinc	680	MW-39	May 1996	11,000*	None
Total Metals					
Aluminum	750	MW-45	July 2005	N/A	
Arsenic	99	MW-37	September 2000	N/A	N/A
Barium	861	PZ-41	May 2010	N/A	N/A
Cadmium	11	MW-22	July 1997	N/A	N/A
Chromium	2,600	MW-22	July 1997	N/A	N/A
Lead	19.3	PZ-47	February 2010	N/A	N/A
Nickel	810	MW-22	July 1997	N/A	N/A
Zinc	5,500	MW-22	July 1997	N/A	N/A

Notes:

Concentrations in bold exceed the EPA MCL or EPA tapwater RSL if no MCL is established (EPA 2010).

Table derived from RFI and supplemental investigations (Heritage 1998a, 2000b, c, d; RMT 2006; SM&A 2010).

* EPA does not specify a MCL for this constituent (EPA 2010). EPA tap water RSL was used (EPA 2010).

EPA U.S. Environmental Protection Agency
MCL Maximum contaminant level
µg/L Micrograms per liter
N/A Not applicable. MCLs are established for dissolved concentrations.
RCRA Resource Conservation and Recovery Act
RFI RCRA Facility Investigation
RSL Regional screening level

Because of relatively low yields from surficial aquifer materials, the facility production well is completed in Cambrian sandstone, to a depth of about 1,633 feet bgs. The next closest production well, according to Iowa Geological Survey records, is an irrigation well for the former golf course. The golf course irrigation well is over 870 feet deep and located approximately 2,000 feet east of the facility. An ice company commercial well, also over 870 feet deep, is located approximately 2,500 feet north of the facility. The nearest municipal drinking water well, over 2,020 feet deep, is located approximately 2,750 feet north of the facility (Heritage 1994, SM&A 2010).

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

_____ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

__X__ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Horizontal Extent

Horizontal migration of contaminated groundwater has not stabilized based on the incomplete delineation of contamination north of the facility boundary. Monitoring well MW-53, a perimeter monitoring well located north of the facility and Manufacturers' Ditch, was contaminated with VC at a concentration exceeding the EPA MCL during the 2010 RFI supplemental investigation (see Table 2) (SM&A 2010). No monitoring wells or piezometers are located north or west of monitoring well MW-53 to determine the extent of contamination or verify the groundwater flow direction with distance from Manufacturers' Ditch. Additionally, monitoring well MW-53 has been sampled only one time, so the impact of seasonal fluctuations on contaminant concentrations in and around the well cannot be determined.

Moreover, horizontal migration of contaminated groundwater does not appear to have stabilized based on increasing concentrations of hazardous constituents in some designated monitoring well locations beyond the northern, downgradient facility boundary. During the 2010 RFI supplemental investigation, groundwater samples collected from these wells had concentrations of *cis*-1,2-DCE, TCE, and VC exceeding EPA MCLs (see Table 2) (SM&A 2010). When compared with the *cis*-1,2-DCE, TCE, and VC results from previous RFI investigations, concentrations had increased in some of these downgradient wells but decreased in others (see Table 3) (RMT 2008, SM&A 2010). Increased concentrations of *cis*-1,2-DCE, TCE, and/or VC were observed in six monitoring wells (MW-2, -13, -36, -37, -38, -45) between the 2005 and 2010 RFI supplemental investigations, and in four monitoring wells (MW-13, -36, -37, -45) between the 1995 RFI and 2010 RFI supplemental investigation. For one downgradient well (MW-53) and two downgradient piezometers (PZ-35 and PZ-36), the absence of multiple data points made it impossible to determine how concentrations in these wells were changing.

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

TABLE 2 – 2010 WELL AND PIEZOMETER DETECTIONS EXCEEDING MCLS DOWNGRADIENT OF THE FACILITY BOUNDARY

Well	Constituent	EPA MCL (µg/L)	Concentration, 2010 (µg/L)
MW-2	*cis*-1,2-Dichloroethene	70	**418**
	Vinyl Chloride	2	**91.8**
MW-13	Trichloroethene	5	**21.3**
	Vinyl Chloride	2	**2.2**
MW-35	*cis*-1,2-Dichloroethene	70	**269**
	Vinyl Chloride	2	**16.8**
PZ-35	*cis*-1,2-Dichloroethene	70	**120**
	Vinyl Chloride	2	**22.1**
MW-36	*cis*-1,2-Dichloroethene	70	**310**
	Vinyl Chloride	2	**34.1**
PZ-36	*cis*-1,2-Dichloroethene	70	**278**
	Vinyl Chloride	2	**29**
MW-37	*cis*-1,2-Dichloroethene	70	**287**
	Vinyl Chloride	2	**89.2**
MW-38	Vinyl Chloride	2	**86.8**
MW-45	*cis*-1,2-Dichloroethene	70	**109**
	Trichloroethene	5	**5.67**
	Vinyl Chloride	2	**4.45**
MW-53	Vinyl Chloride	2	**2.16**

Notes:

Concentrations in bold exceed the EPA MCL (EPA 2010).

Concentrations with shading exceed 10 times the MCL (EPA 2010).

Data were obtained during the 2010 RFI supplemental investigation (SM&A 2010).

EPA U.S. Environmental Protection Agency
MCL Maximum contaminant level
µg/L Micrograms per liter
RCRA Resource Conservation and Recovery Act
RFI RCRA Facility Investigation

TABLE 3 – HISTORICAL DATA FOR TABLE 2 WELLS AND PIEZOMETERS

Well	Constituent	EPA MCL (µg/L)	Result 08/95 (µg/L)	Result 05/96 (µg/L)	Result 03/97 (µg/L)	Result 07/97 (µg/L)	Result 10/97 (µg/L)	Result 01/98 (µg/L)	Result 07/05 (µg/L)	Result 05/10 (µg/L)	Change 2005 to 2010	Change Overall
MW-2	*cis*-1,2-Dichloroethene	70	NA	720	NA	NA	NA	NA	415	418	+	-
	Trichloroethene	5	36	40	64	89	92	81	5.77	3.61	-	-
	Vinyl Chloride	2	140	99	180	200	100	130	84.5	91.8	+	-
MW-13	*cis*-1,2-Dichloroethene	70	NA	17	NA	NA	NA	NA	9.54	53.2	+	+
	Trichloroethene	5	11	11	8	10	8	9	5.67	21.3	+	+
	Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND	2.2	+	+
MW-35	*cis*-1,2-Dichloroethene	70	--	270	NA	NA	NA	NA	283	269	-	-
	Trichloroethene	5	--	130	75	84	86	97	80.5	28.7	-	-
	Vinyl Chloride	2	--	49	74	50	34	60	55.2	16.8	-	-
PZ-35	*cis*-1,2-Dichloroethene	70	--	--	--	--	--	--	--	120	N/A	N/A
	Trichloroethene	5	--	--	--	--	--	--	--	<1	N/A	N/A
	Vinyl Chloride	2	--	--	--	--	--	--	--	22.1	N/A	N/A
MW-36	*cis*-1,2-Dichloroethene	70	--	440	NA	NA	NA	NA	309	310	+	-
	Trichloroethene	5	--	57	21	21	17	15	1.58	<1	-	-
	Vinyl Chloride	2	--	33	60	50	30	46	40.2	34.1	-	+
PZ-36	*cis*-1,2-Dichloroethene	70	--	--	--	--	--	--	--	278	N/A	N/A
	Trichloroethene	5	--	--	--	--	--	--	--	<1	N/A	N/A
	Vinyl Chloride	2	--	--	--	--	--	--	--	29	N/A	N/A
MW-37	*cis*-1,2-Dichloroethene	70	--	500	NA	NA	NA	NA	317	287	-	-
	Trichloroethene	5	--	ND	ND	ND	ND	ND	1.02	1.09	+	+
	Vinyl Chloride	2	--	86	140	150	73	110	103	89.2	-	+
MW-38	*cis*-1,2-Dichloroethene	70	--	56	NA	NA	NA	NA	9.94	35.5	+	-
	Trichloroethene	5	--	ND	ND	ND	ND	ND	<0.81	<1	N/A	N/A
	Vinyl Chloride	2	--	210	430	500	280	320	186	86.8		
MW-45	*cis*-1,2-Dichloroethene	70	--	--	--	--	--	--	8.8	109	+	+
	Trichloroethene	5	--	--	--	--	--	--	6.59	5.67	-	-
	Vinyl Chloride	2	--	--	--	--	--	--	<0.22	4.45	+	+

TABLE 3 – HISTORICAL DATA FOR TABLE 2 WELLS AND PIEZOMETERS

Well	Constituent	EPA MCL (µg/L)	Result 08/95 (µg/L)	Result 05/96 (µg/L)	Result 03/97 (µg/L)	Result 07/97 (µg/L)	Result 10/97 (µg/L)	Result 01/98 (µg/L)	Result 07/05 (µg/L)	Result 05/10 (µg/L)	Change 2005 to 2010	Change Overall
MW-53	*cis*-1,2-Dichloroethene	70	--	--	--	--	--	--	--	35.6	N/A	N/A
	Trichloroethene	5	--	--	--	--	--	--	--	<1	N/A	N/A
	Vinyl Chloride	2	--	--	--	--	--	--	--	**2.16**	N/A	N/A

Notes:

Concentrations in bold exceed the EPA MCL (EPA 2010).

Concentrations with shading exceed 10 times the EPA MCL (EPA 2010).

Data were obtained during the 1995 RFI and supplemental investigations through 2010 (RMT 2008, SM&A 2010).

+	Concentration increases
-	Concentration decreases
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
µg/L	Micrograms per liter
N/A	Not applicable (net change cannot be calculated from a single data point or only nondetect results)
NA	Not analyzed
ND	Not detected
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation

Of the wells identified in Tables 2 and 3, all are located between the northern facility boundary and Manufacturers' Ditch except for monitoring wells MW-45 and MW-53, which are located north of Manufacturers' Ditch (see Attachment 1) (SM&A 2010).

While the facility's calculations may indicate that Manufacturers' Ditch is acting to capture shallow groundwater, the actual volume and depth of that capture are unclear. The ditch exhibits very low flow and is only 3 to 5 feet deep (base approximately 579 to 581 feet above mean sea level [amsl]) (SM&A 2010). The contaminated wells identified in Table 2 range in depth from 9.95 feet deep at MW-38 (base 575.52 feet amsl) to 52.24 feet deep at MW-53 (base 532.52 feet amsl) (SM&A 2010). Additionally, the presence of subsurface confining layers may limit the ability of Manufacturers' Ditch to capture underlying groundwater. Monitoring wells north of Manufacturer's Ditch in the upper unconsolidated sediments/weathered bedrock (MW-44, MW-45, and MW-46) and in the lower unconsolidated sediments/upper bedrock (MW-44D, MW-53, and MW-53S) are screened below a confining layer, resulting in artesian conditions (SM&A 2010). Ultimately, the presence of facility-related contaminants north of Manufacturers' Ditch indicates effective capture is unlikely.

Vertical Extent

Vertical migration of contaminated groundwater appears to be contained by confining beds, although vertical delineation of contamination beneath the facility is incomplete.

Facility wells screened in the deep bedrock and lower unconsolidated sediment/upper bedrock units are contaminated with VOCs (see Table 4) (SM&A 2010). However, because of the limited data available for the wells installed in these units, it is difficult to determine whether contaminated groundwater is migrating vertically. Of the two wells installed in the deep bedrock unit (MW-42D and MW-43), MW-42D had concentrations of naphthalene that exceeded the EPA RSL for naphthalene. During the 2010 RFI supplemental investigation, the groundwater sample from MW-42D contained naphthalene (0.219 µg/L) at a concentration exceeding its screening level of 0.14 µg/L. Although no other groundwater sample from the facility contained naphthalene, the groundwater sample from MW-42D also contained two facility-related contaminants of concern—*cis*-1,2-DCE and TCE. None of these contaminants was detected in the groundwater sample from MW-43.

TABLE 4 – 2010 WELL AND PIEZOMETER DETECTIONS EXCEEDING MCLS, DEEP BEDROCK AND LOWER UNCONSOLIDATED SEDIMENT/UPPER BEDROCK UNITS

Well	Constituent	EPA MCL (µg/L)	Concentration, 2010 (µg/L)
MW-42	*cis*-1,2-Dichloroethene	70	**288**
	Trichloroethene	5	**389**
	Vinyl Chloride	2	**60.6**
MW-42D	Naphthalene	0.14*	**0.219**
MW-51	Trichloroethene	5	**13.6**
MW-53	Vinyl Chloride	2	**2.16**

Notes:

Concentrations in bold exceed the EPA MCL or EPA tapwater RSL if no MCL is established (EPA 2010).

Concentrations with shading exceed 10 times the EPA MCL or RSL (EPA 2010).

Data were obtained during the 1995 RFI and supplemental investigations through 2010 (RMT 2008, SM&A 2010).

* EPA does not specify a MCL for this constituent. EPA tapwater RSL was used (EPA 2010).

EPA U.S. Environmental Protection Agency
MCL Maximum contaminant level
µg/L Micrograms per liter
RCRA Resource Conservation and Recovery Act
RFI RCRA Facility Investigation

Of the monitoring wells installed in the deep bedrock and lower unconsolidated sediment/upper bedrock units, only MW-42, MW-43, MW-47, and MW-48 had been sampled prior to the 2010 sampling event—during the 2005 RFI supplemental investigation (RMT 2008, SM&A 2010). For this reason, monitoring wells MW-43, MW-47, and MW-48 are included with the Table 4 wells in the Table 5 stability evaluation. For three deep wells with MCL exceedances (MW-42D, MW-51, and MW-53), absence of multiple data points made it impossible to determine how concentrations in these wells were changing. Comparisons of the *cis*-1,2-DCE, TCE, VC, and naphthalene results from the 2010 and 2005 RFI supplemental investigations indicate that concentrations increased in some deep wells but decreased in others (see Table 5) (RMT 2008, SM&A 2010).

TABLE 5 – HISTORICAL DATA FOR TABLE 4 WELLS AND SELECT OTHER WELLS IN THE DEEP BEDROCK AND LOWER UNCONSOLIDATED SEDIMENT/UPPER BEDROCK UNITS

Well	Constituent	EPA MCL (µg/L)	Result 07/05 (µg/L)	Result 05/10 (µg/L)	Change Overall
MW-42	*cis*-1,2-Dichloroethene	70	**150**	**288**	+
	Trichloroethene	5	**203**	**389**	+
	Vinyl Chloride	2	**77.9**	**60.6**	-
	Naphthalene	0.14*	NA	<0.1	N/A
MW-42D	*cis*-1,2-Dichloroethene	70	--	2.18	N/A
	Trichloroethene	5	--	2.28	N/A
	Vinyl Chloride	2	--	<1	N/A
	Naphthalene	0.14*	--	**0.219**	N/A
MW-43	*cis*-1,2-Dichloroethene	70	11.8	10.9	-
	Trichloroethene	5	<0.81	<1	N/A
	Vinyl Chloride	2	<0.22	<1	N/A
	Naphthalene	0.14*	NA	<0.1	N/A
MW-47	*cis*-1,2-Dichloroethene	70	<0.83	1.7	+
	Trichloroethene	5	<0.81	<1	N/A
	Vinyl Chloride	2	<0.22	<1	N/A
	Naphthalene	0.14*	NA	<0.1	N/A
MW-48	*cis*-1,2-Dichloroethene	70	<0.83	<1	N/A
	Trichloroethene	5	<0.81	<1	N/A
	Vinyl Chloride	2	0.31	<1	N/A
	Naphthalene	0.14*	NA	<0.1	N/A
MW-51	*cis*-1,2-Dichloroethene	70	--	13.5	N/A
	Trichloroethene	5	--	**13.6**	N/A
	Vinyl Chloride	2	--	<1	N/A
	Naphthalene	0.14*	--	<0.1	N/A
MW-53	*cis*-1,2-Dichloroethene	70	--	35.6	N/A
	Trichloroethene	5	--	<1	N/A
	Vinyl Chloride	2	--	**2.16**	N/A
	Naphthalene	0.14*	--	<0.1	N/A

Notes:

Concentrations in bold exceed the EPA MCL or EPA RSL if no MCL is established (EPA 2010).

Concentrations with shading exceed 10 times the EPA MCL or RSL (EPA 2010).

Data were obtained during the 1995 RFI and supplemental investigations through 2010 (RMT 2008, SM&A 2010).

* EPA does not specify a MCL for this constituent. EPA RSLs were used (EPA 2010).

+	Concentration increases
-	Concentration decreases
EPA	U.S. Environmental Protection Agency
MCL	Maximum contaminant level
µg/L	Micrograms per liter
N/A	Not applicable (net change cannot be calculated from a single data point or only nondetect results)
NA	Not analyzed
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation

Regardless of this uncertainty about vertical migration, confining beds should act to intercept contaminated groundwater before it spreads into uncontaminated, deeper aquifers. The Silurian aquifer in which the monitoring

wells are installed is only about 155 feet thick at the facility (Heritage 1994). This is underlain by about 300 to 600 feet of Ordovician sandstone, dolomite, and shale confining layers (Heritage 1994). Moreover, the Jordan Sandstone, which is the principal water-bearing unit in the underlying Cambrian-Ordovician aquifer, is another 400 feet farther down (Heritage 1994).

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

__X__ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

This question is answered for informational purposes only.

The nearest surface water body to the facility is Manufacturers' Ditch. Manufacturers' Ditch discharges to Mill Creek approximately 0.6 mile southwest of the site (Heritage 1994). Approximately 0.8 mile northwest of that confluence, Mill Creek discharges to Beaver Slough of the Mississippi River system (Heritage 1994, SM&A 2010). The elevation of the Mississippi River at normal pool is approximately 572 feet amsl (Heritage 1994).

In the response to Question 3, Table 2 identifies the wells and piezometers adjacent to Manufacturers' Ditch with detections exceeding MCLs. As noted in the response to Question 3, the facility used groundwater elevation data from the 2010 RFI supplemental investigation to demonstrate that groundwater flow in the first saturated unit, upper unconsolidated sediment/weathered bedrock, and lower unconsolidated sediment/upper bedrock is generally toward Manufacturers' Ditch (SM&A 2010). The facility also used the 2010 RFI supplemental investigation data to verify the presence of upward vertical gradients in multiple well nests along Manufacturers' Ditch (SM&A 2010). The facility's interpretation of the data indicates Manufacturers' Ditch is acting to capture some shallow groundwater, although the actual volume and depth of that capture are unclear.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

__X__ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

This question is answered for informational purposes only.

Based on the concentrations of VOCs in groundwater collected near Manufacturers' Ditch, the discharge of contaminated groundwater into surface water is likely to be significant. Table 2 in the response to Question 3 lists the monitoring wells and piezometers adjacent to Manufacturers' Ditch with contaminant detections exceeding EPA MCLs. Detections exceeding 10 times the EPA MCL are indicated on the table in bold. VC concentrations in monitoring wells MW-2 (91.8 µg/L), MW-36 (34.1 µg/L), MW-37 (89.2 µg/L), and MW-38 (86.8 µg/L), and piezometers PZ-35 (22.1 µg/L) and PZ-36 (29 µg/L) exceeded 10 times the EPA MCL of 2 µg/L. Table 3 in the response to Question 3 demonstrates that contaminant concentrations in groundwater are increasing in some wells and decreasing in others.

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment[5], appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

__X__ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

This question is answered for informational purposes only.

Given the concentrations of PAHs and metals found in sediment downgradient of the facility, the discharge of contaminated groundwater to these media may be unacceptable.

Conflicts w/ statement on previous page.

Surface water from Manufacturers' Ditch near the facility does not appear to be contaminated. No VOCs or PAHs were detected in the four surface water samples collected during the 2010 RFI supplemental investigation (SM&A 2010). Dissolved and total barium were detected in each sample, but at concentrations below the EPA Region 5 ecological screening levels (ESL) (SM&A 2010). Reporting limits exceeded ESLs for hexachlorobutadiene, benzo(a)anthracene, benzo(a)pyrene, mercury, and silver. Although none of these compounds was detected in groundwater, benzo(a)anthracene and benzo(a)pyrene were detected in soil samples collected at the facility (SM&A 2010).

---

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5]The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

Sediment from Manufacturers' Ditch near the facility appears to be contaminated. Four sediment samples were collected during the 2010 RFI supplemental investigation (SM&A 2010). Acetone, carbon disulfide, benzo(b)fluoranthene, fluoranthene, pyrene, and metals were detected (SM&A 2010). Concentrations of acetone, chromium, fluoranthene, and pyrene exceeded EPA Region 5 ESLs (SM&A 2010). Reporting limits exceeded ESLs for cadmium, total cyanide, silver, several PAHs, acrylonitrile, methyl ethyl ketone, 1,1,-dichloroethane, and hexachlorobutadiene (SM&A 2010).

TABLE 6 – 2010 SEDIMENT DETECTIONS EXCEEDING MCLS

Sample Location	*Constituent*	*EPA ESL (mg/kg)*	*Concentration, 2010 (mg/kg)*
SD-1	*Acetone*	*0.0099*	***0.144***
SD-2	*Acetone*	*0.0099*	***0.139***
	Fluoranthene	*0.423*	***0.658***
	Pyrene	*0.195*	***0.531***
	Chromium	*43.4*	***49.6***
SD-3	*Acetone*	*0.0099*	***0.146***
SD-4	*Acetone*	*0.0099*	***0.0651***

Notes:

Concentrations in bold exceed the ESL (EPA 2010).

Data were obtained during the 2010 RFI supplemental investigation (SM&A 2010).

EPA U.S. Environmental Protection Agency
ESL EPA Region 5 Ecological Screening Level
mg/kg Milligrams per kilogram
RCRA Resource Conservation and Recovery Act
RFI RCRA Facility Investigation

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

_____ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

__X__ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

This question is answered for informational purposes only.

The Collis facility does not have an ongoing program of groundwater monitoring. Collis stopped using its sludge impoundments in 1979, before the RCRA Subtitle C requirements for hazardous waste disposal facilities came into effect in November 1980. As a result, the unit was not required to obtain a permit from EPA for the impoundments; nor was the facility subject to the interim status requirements. Because the facility continued to generate hazardous waste, it was subject to corrective action, which is conducted under an AOC. However, the AOC does not require ongoing groundwater monitoring. The only groundwater samples collected at the facility have been in support of the RFI (Tetra Tech Inc. [Tetra Tech] 2003, 2010).

8. Check the appropriate RCRA Info status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

_____ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Collis Inc. facility, EPA ID #IAD047303771, located at 2005 S. 19th Street, Clinton, Iowa. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

__X__ NO - Unacceptable migration of contaminated groundwater is observed or expected.

_____ IN - More information is needed to make a determination.

Completed by _____ Date_____
(signature)
Bill Ferguson
Project Manager, RCRA Corrective Action & Permits Branch
EPA Region 7

Supervisor _____ Date_____
(signature)
John Smith
Acting Branch Chief, RCRA Corrective Action & Permits Branch
EPA Region 7

Locations where References may be found:

EPA Region 7 Headquarters
RCRA Files
901 North 5th Street
Kansas City, Kansas 66101

Contact telephone and e-mail numbers

Bill Ferguson
913-551-7037
Ferguson.Bill@epa.gov

REFERENCES

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RMT. 2006. "RCRA Facility Investigation (RFI) Addendum Report, Collis, Inc." June.

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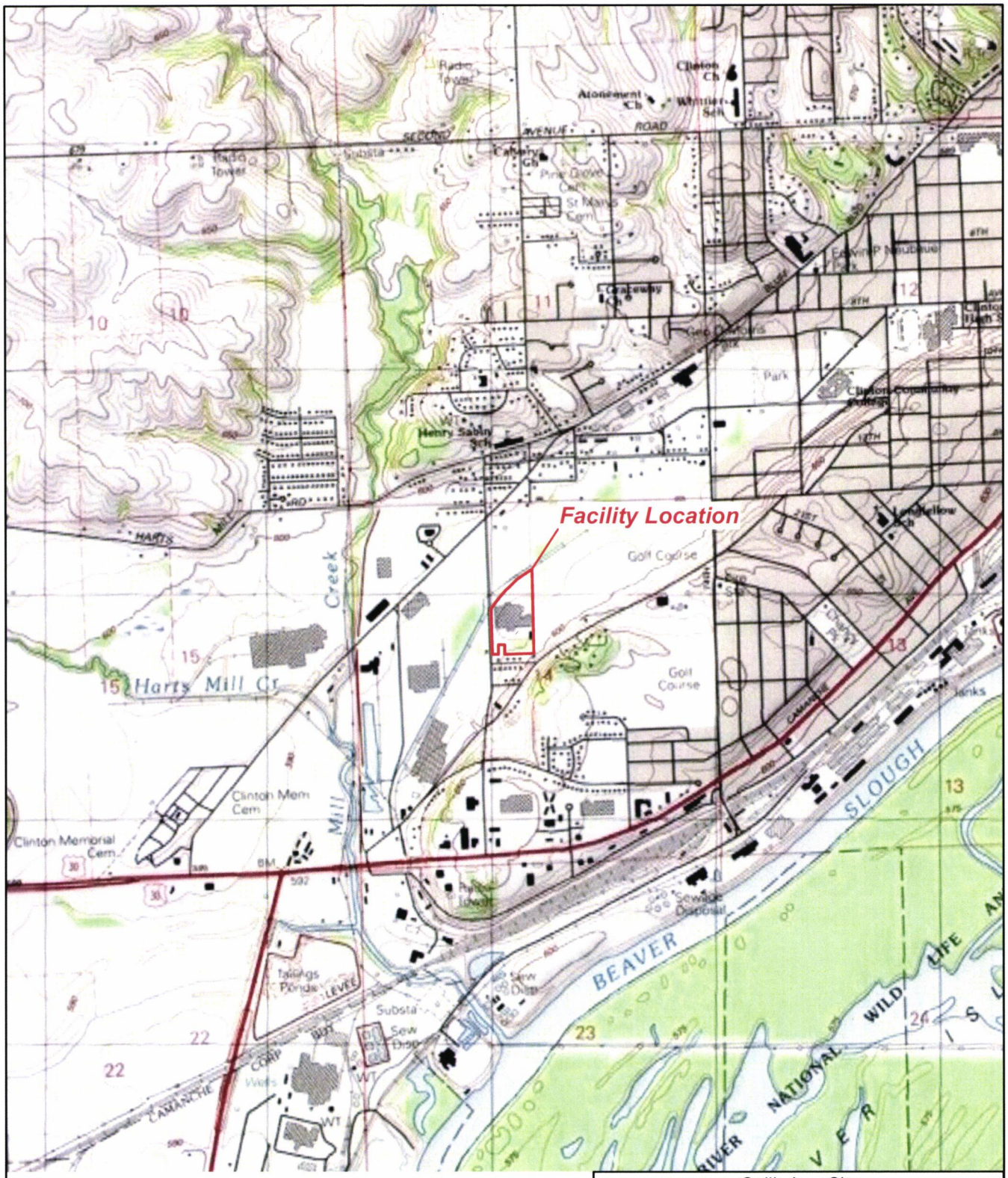
Tetra Tech. 2010. Record of telephone conversation regarding groundwater monitoring at Collis. Between Jessica Kidwell, Tetra Tech, and Bill Ferguson, EPA. August.

FIGURES

(2 pages)



Source: USGS Clinton, Iowa 7.5 Minute Topo Quad, 1991

Collis Inc. Site
2005 S. 19th Street
Clinton, Iowa 52732

Figure 1
Facility Location Map

TETRA TECH EM INC.

Date: 08/24/10 Drawn By: Nick Wiederholt Project No: G9022.007.038.02

X:\G\9022\007\038\02\Collis\Projects\mxd\Figure1.mxd

Propane Tank
Flammable Storage Bldg
Waste Oil Tank
Receiving
Receiving Area
Emergency Lacquer Dump Tank
Powder Coating Area
Clinton Facility Building
Manufacturing Area
Water Supply Well
Zinc Platting Area
Office Area
MANUFACTURER'S DITCH
South 19th Street

Areas Within Specified SWMU's Identified in Consent Decree

1. Acid Storage Tank
2. Cleaner Storage Tank
3. Settling Basin
4. Temporary Storage Basin
5. Filter House
6. Sludge Impoundments
7. Chemical Storage Area
8. Receiving Dock Inside Storage Area
9. Receiving Dock Outside Storage Area
10. Spent Chromic Acid Tank
11. Preatreatment Tanks Area
12. Nitric Acid Storage Tank
13. HCL Storage Tank
14. Zinc Storage Tank
15. Epoxy Lacquer Tank

Legend

- Fence
- Railroad
- Facility Boundary
- Parking Area

Solid Waste Management Units (SWMUs)

- FDS - Floor Drains, Sump, and Overhead Pipe System (SWMU #1)
- PCA - Pollution Control Building (SWMU #2)
- SMA - Sludge Management Area (SWMU #3)
- SIA - Sludge Impoundment Area (SWMU #4)
- SCT - Spent Chromic Acid Tank (SWMU #5)
- CPA - Closure Pretreatment Area (SWMU #6)
- NEY - Northeast Yard (SWMU #7)
- MDA - Manufacturers Ditch (SWMU #8)

N

0 55 110

Feet

Source: RMT, January 2008
SM&A, July 2010
Base Map Developed From Site Plan Prepared By Heritage Environmental Services Project No. 5194, May 1996

Collis Inc. Site
2005 S. 19th Street
Clinton, Iowa 52732

Figure 2
Site Layout Map

TETRA TECH EM INC.

Date: 08/24/2010 Drawn By: Nick Wiederholt Project No: G9022.007.038.02

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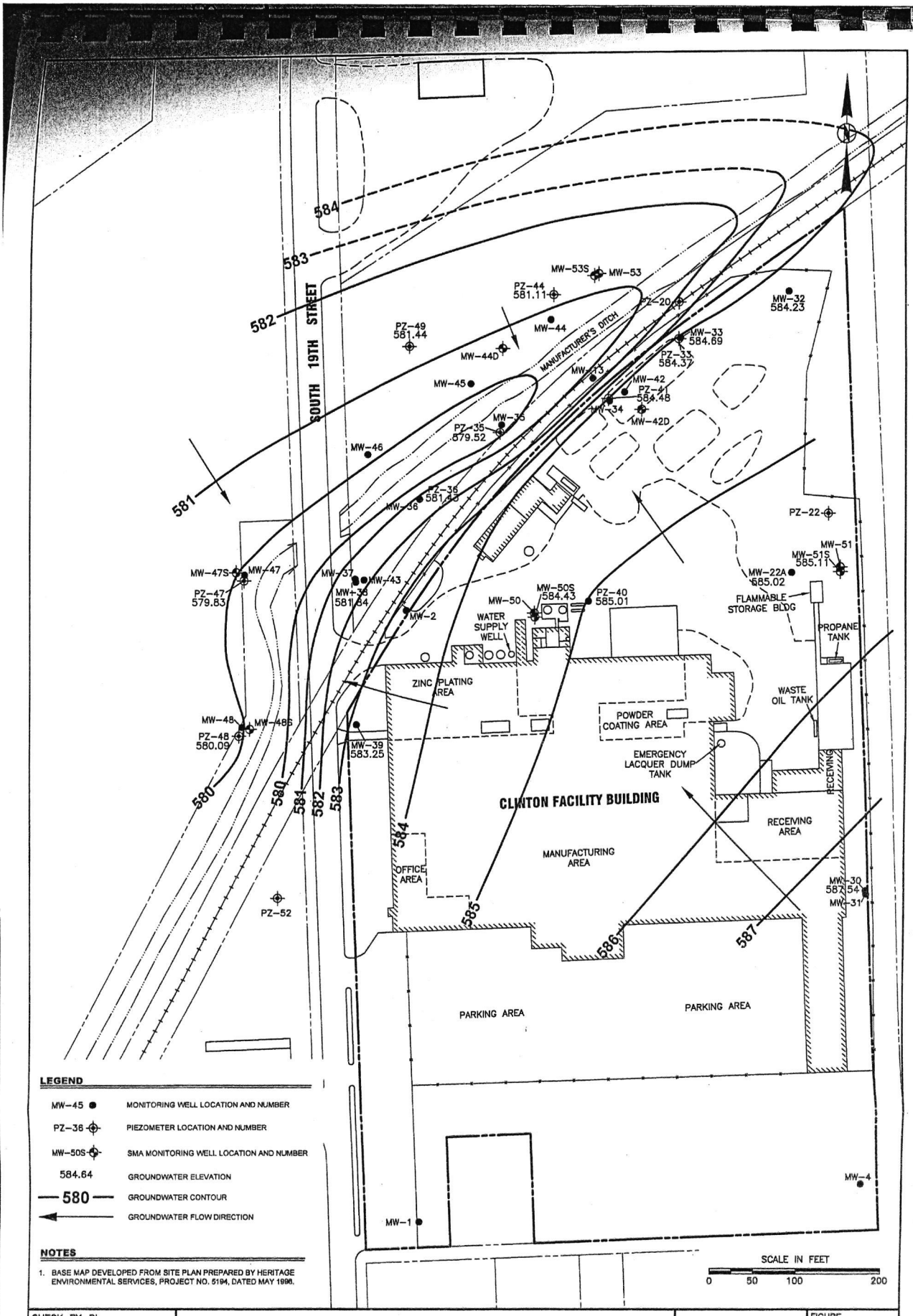
ATTACHMENT 1
FACILITY POTENTIOMETRIC SURFACE MAPS

(4 pages)



LEGEND

MW-45 ●	MONITORING WELL LOCATION AND NUMBER
PZ-36 ⊕	PIEZOMETER LOCATION AND NUMBER
MW-50S ⊕	SMA MONITORING WELL LOCATION AND NUMBER
584.64	GROUNDWATER ELEVATION
580	GROUNDWATER CONTOUR
←	GROUNDWATER FLOW DIRECTION

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PREPARED BY HERITAGE ENVIRONMENTAL SERVICES, PROJECT NO. 5194, DATED MAY 1996.

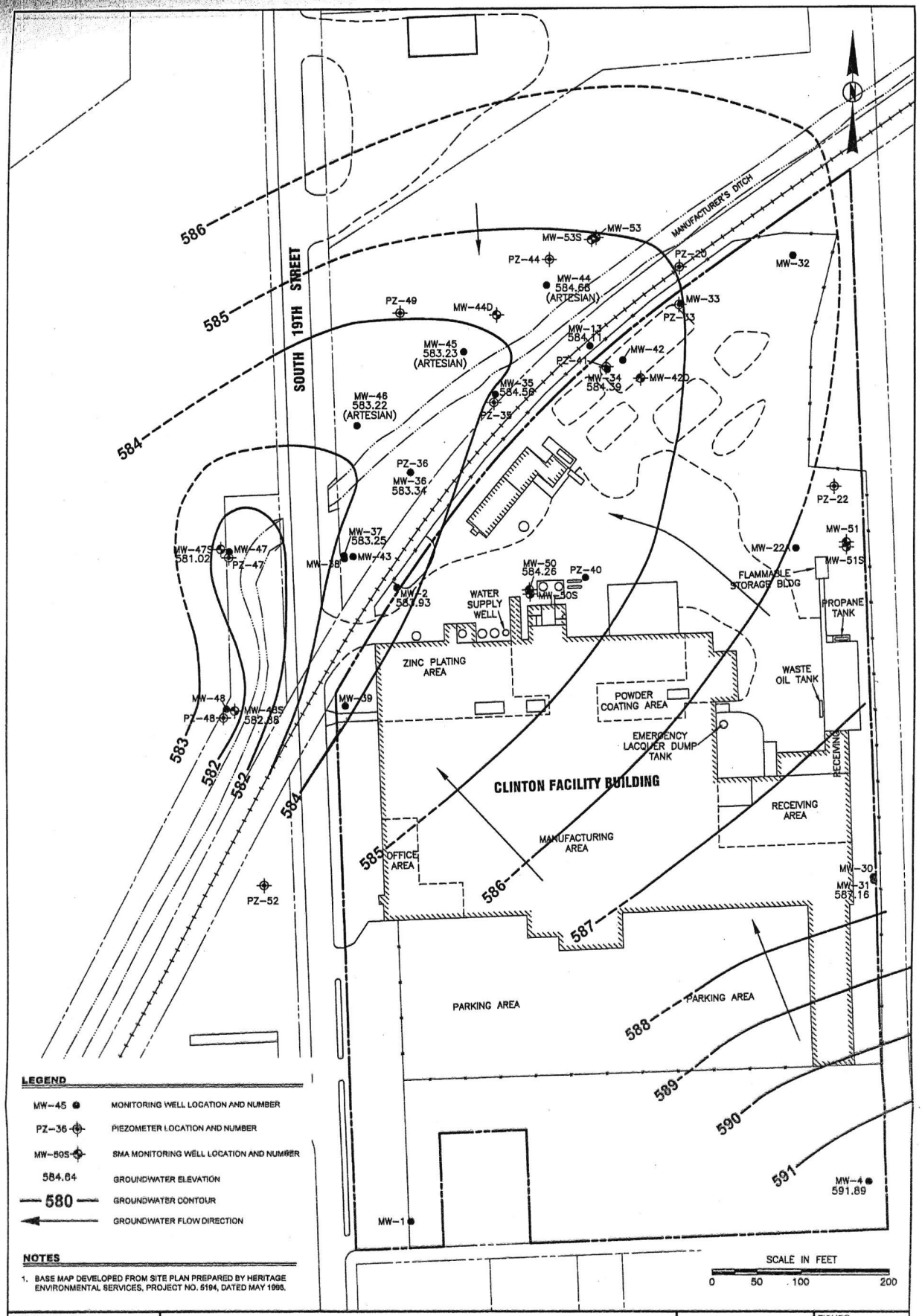
CHECK BY	DL
DRAWN BY	OS
DATE	7-30-10
SCALE	AS SHOWN
CAD NO.	10002.05D
PRJ NO.	15-10002

POTENTIOMETRIC SURFACE MAP
FIRST SATURATED UNIT
MAY 3, 2010

COLLIS INC.
CLINTON, IOWA

SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES

FIGURE
12



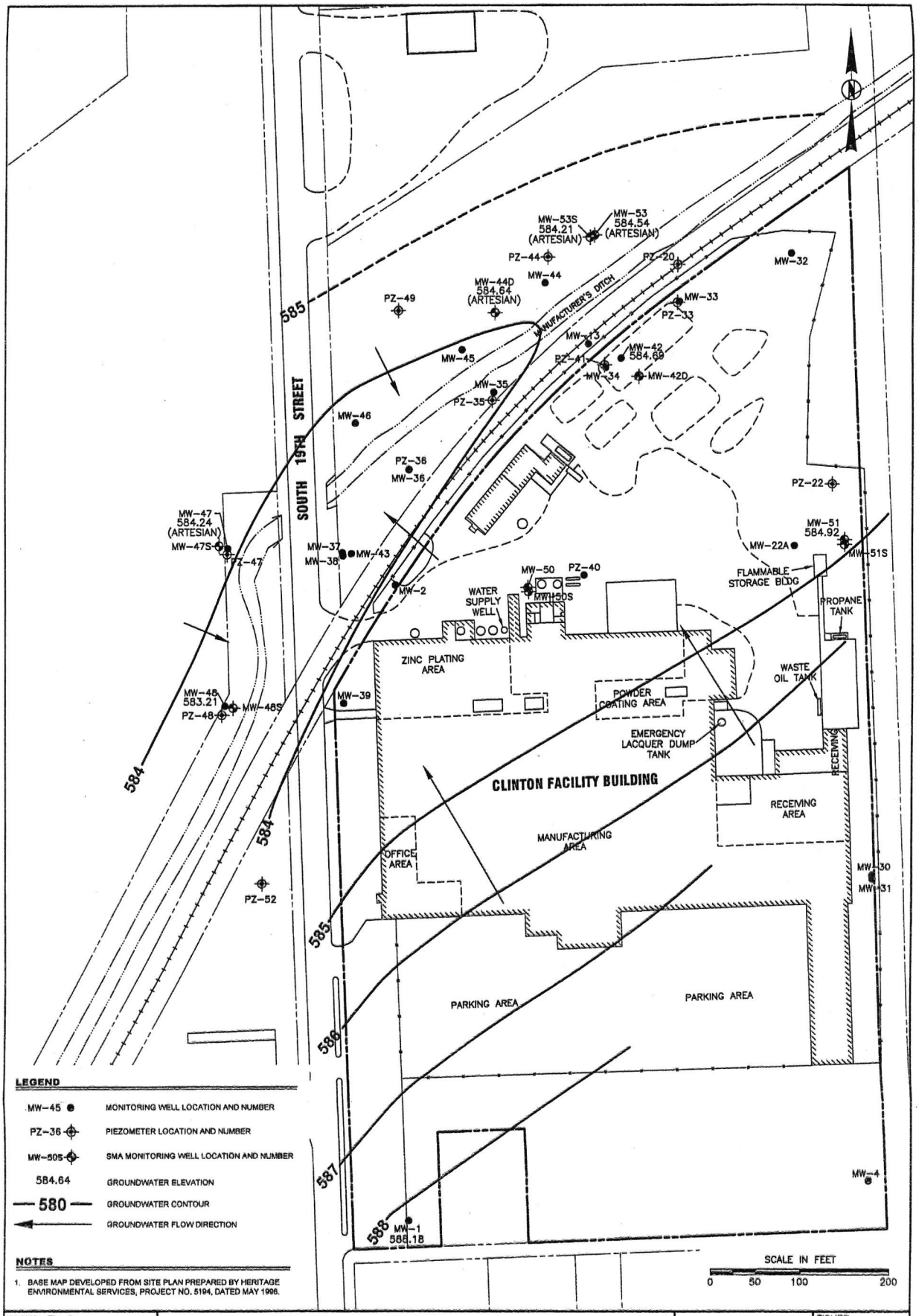
CHECK BY	DL
DRAWN BY	OS
DATE	7-30-10
SCALE	AS SHOWN
CAD NO.	10002.05F
PRJ NO.	15-10002

POTENTIOMETRIC SURFACE MAP
UPPER UNCONSOLIDATED SEDIMENTS AND WEATHERED BEDROCK
MAY 3, 2010

COLLIS INC.
CLINTON, IOWA

SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES

FIGURE
13



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DATE	7-30-10
SCALE	AS SHOWN
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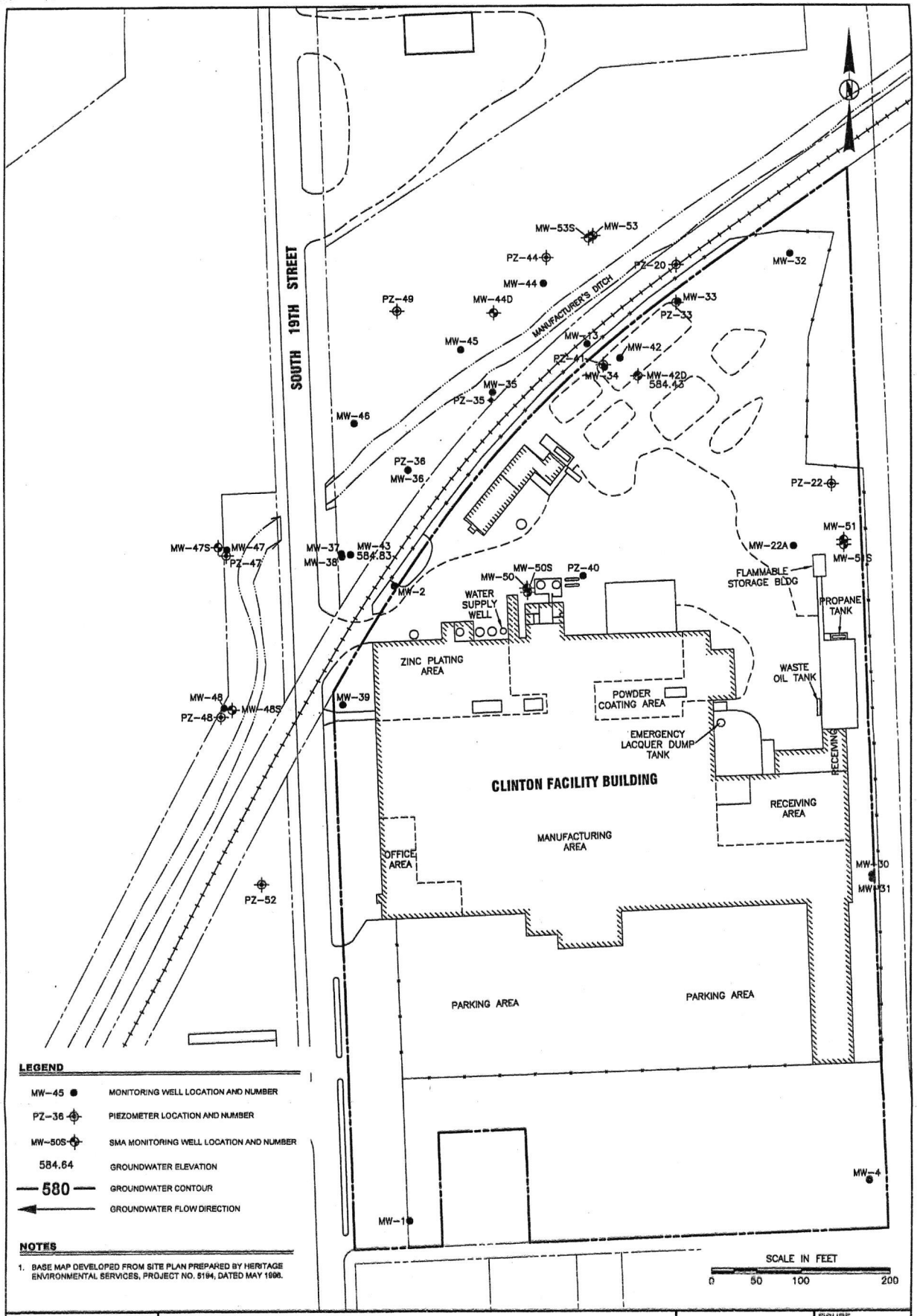
PRJ NO.	15-10002

POTENTIOMETRIC SURFACE MAP
LOWER UNCONSOLIDATED SEDIMENTS AND UPPER BEDROCK
MAY 3, 2010

COLLIS INC.
CLINTON, IOWA

SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES

FIGURE
14



LEGEND

MW-45 ●	MONITORING WELL LOCATION AND NUMBER
PZ-36 ⊕	PIEZOMETER LOCATION AND NUMBER
MW-50S ⊕	SMA MONITORING WELL LOCATION AND NUMBER
584.64	GROUNDWATER ELEVATION
580	GROUNDWATER CONTOUR
◄	GROUNDWATER FLOW DIRECTION

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PREPARED BY HERITAGE ENVIRONMENTAL SERVICES, PROJECT NO. 5194, DATED MAY 1998.

CHECK BY	DL
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DATE	7-30-10
SCALE	AS SHOWN
CAD NO.	10002.05E
PRJ NO.	15-10002

GROUNDWATER ELEVATIONS
DEEP BEDROCK
MAY 3, 2010

COLLIS INC.
CLINTON, IOWA

SVM&A
ST. JOHN • MITTELHAUSER & ASSOCIATES

FIGURE
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